Groundwater Banking (ASR) Strawman - Revised

Definitions

Injected water: water that is injected into an aquifer in the eastern Virginia and Eastern Shore Groundwater Management Areas.

Groundwater storage credit: the total quantity of injected water that is authorized to be recovered from the aquifer. Credit available for use in a given year is equal to the remaining injected water at the end of the previous year multiplied by the recovery factor. Credit is deposited into the permittee's groundwater storage account at DEQ and retired when authorized water is recovered.

Recovery factor: the annual fraction of the remaining injected water that is available for recovery by a permittee. The recovery factor is calculated as one minus the aggregate annual water loss rate. (If beyond one year? – Sandi McNinch)

GW storage account: DEQ will maintain and publish annually a groundwater storage account for any permittee holding groundwater storage credits.

Recovery zone: the area within the spatial boundary from which injected water is authorized to be recovered.

Seasonal storage: injected water that may be recovered within 12 months of the date of injection.

Long term storage: injected water that may be withdrawn across multiple years.

Water loss rate: the rate at which injected water is lost for recovery. (Determined by whom and when? – Sandi McNinch)

Groundwater Storage Credit

Within existing groundwater management areas, DEQ will grant a *groundwater storage credit* to any party that injects water into the coastal aquifer for purposes of using the aquifer for water storage and recovery. (Or add a new definition if this means both seasonal and storage – Sandi McNinch)

A groundwater storage credit is considered additional to a groundwater allocation granted under a groundwater withdrawal permit. Groundwater allocations shall not be reduced based on injection activity of the permittee.

A well injection permit would be required before any water is injected into the Virginia aquifers.

Seasonal Storage

Recovery factor for seasonal storage shall be 1. (1:1 inject to recovery rate)

Credit duration: 1 year. Credits not used within the year of being injected will be retired.

Spatial Recovery: Recovery occurs at the same facility as injection.

Credit transfer between permittees: None

Long Term Storage

Recovery factor: Recovery factors will be based on estimated *annual aquifer losses* using the groundwater model. Guidelines for estimating aquifer losses will be published and updated by DEQ. For projects injecting into the Potomac coastal plain aquifer, the recovery factor shall not be less than "to be determined".

A recovery factor schedule covering 10 years will be established by DEQ. Once established, the 10-year schedule shall not be modified. At the end of the 10-year period the schedule will be re-evaluated and the recovery factor may be revised based on new information.

Annual recovery factors contained in the recovery factor schedule may vary across time. For instance, the recovery factor may increase over time if annual loss rates are not constant over time.

DEQ may establish maximum annual limits on the rate of withdrawal from recovery wells.

Spatial Recovery: Recovery can occur off-site of the injection location. The spatial recovery zone will be delineated during the permitting process. DEQ will develop guidelines for defining the spatial recovery zone. The spatial recovery zone will defined to the maximum practical extent and subject to reasonable expectations that no adverse impacts will be imposed on the groundwater resource. The "spatial recovery zone" will be re-evaluated every 10 years.

Credit transfer between permittees: Groundwater storage credits may be transferred to another party within the spatial recovery zone.